

SOLUTIONS TO EXERCISES: THE LANGUAGE OF MATHEMATICS

- 1a. 3
- 1b. $1 + 2$, $3 + 0$, $\frac{1}{2} + \frac{5}{2}$, etc.
- 1c. $4 - 1$, $5 - 2$, $3 - 0$, etc.
- 1d. $6 \div 2$, $9 \div 3$, etc.
2. two: $2 = 1 + 1 = 3 - 1 = 6 \div 3$ etc.
 six: $6 = 4 + 2 = 9 - 3 = 12 \div 2$ etc.
 zero: $0 = -1 + 1 = 2 - 2 = 0 \div 7$ etc.
 one: $1 = \frac{1}{2} + \frac{1}{2} = 3 - 2 = 2 \div 2$ etc.
- 3a. The capital of Massachusetts Boston.
- 3b. The capital of Massachusetts Pittsfield.
- 3c. $3 + 4$ 7
- 3d. $3 + 4$ 8
- 4a. true
- 4b. false
- 4c. true
- 4d. false
5. Proper nouns are capitalized (Massachusetts, Boston). The first letter of a sentence is capitalized; a declarative sentence ends with a period.
- The solutions to 6 and 7 are combined:
- 6a. Carol; English noun
- 6b. Carol loves mathematics; English sentence; sometimes true/sometimes false
- 6c. The name 'Carol' begins with the letter 'C'; English sentence; true
- 6d. 7; mathematical expression
- 6e. $3 + 4$; 'three plus four'; mathematical expression
- 6f. 7 $3 + 4$; 'seven equals three plus four'; mathematical sentence; true
- 6g. $3 + 4$ 7; 'three plus four equals seven'; mathematical sentence; true
- 6h. 7 $3 + 5$; 'seven equals three plus five'; mathematical sentence; false
- 6i. t ; 'tee'; mathematical expression
- 6j. t 2; 'tee equals two'; mathematical sentence; sometimes true/sometimes false
- 6k. 0 $2 - t$; 'zero equals two minus tee'; mathematical sentence; sometimes true/sometimes false
- 6l. $t - 1$; 'tee minus one'; mathematical expression
- 6m. $t - 1$ $1 - t$; 'tee minus one equals one minus tee'; mathematical sentence; sometimes true/sometimes false
- 6n. $t + t + t$; 'tee plus tee plus tee'; mathematical expression
- 6o. $t - 0$ t ; 'tee minus zero equals tee'; mathematical sentence; always true
- 6p. 0 1; 'zero equals one'; mathematical sentence; false
7. (See solutions to problem 6.)

8. EXP
9. EXP
10. EXP
11. SEN, ST/SF
12. EXP
13. EXP
14. SEN, ST/SF
15. SEN, T
16. TRUE: The name 'Julia' begins with the letter 'J'.
FALSE: The name 'Julia' begins with the letter 'G'.
ST/SF: Julia has red hair.
17. TRUE: $1 + 2 = 3$ FALSE: $1 + 4 = 3$ ST/SF: $x = 3$
18. TRUE: $x = x$ FALSE: $x = x + 1$ ST/SF: $x = 1$